



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/976,964	10/11/2001	Edwin James Harris IV	112690-098	2962

29176 7590 03/07/2006

BELL, BOYD & LLOYD LLC  
P. O. BOX 1135  
CHICAGO, IL 60690-1135

EXAMINER

VIJAYAKUMAR, KALLAMBELLA M

ART UNIT PAPER NUMBER

1751

DATE MAILED: 03/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/976,964

Applicant(s)

HARRIS, EDWIN JAMES

Examiner

Kallambella Vijayakumar

Art Unit

1751

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 December 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 42-61 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 51-58 is/are allowed.
- 6) ☒ Claim(s) 42-50, 59-60 is/are rejected.
- 7) ☒ Claim(s) 61 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

Art Unit: 1751

### DETAILED ACTION

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/27/2005 has been entered.

Claims 42-61 are currently pending with the application.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 42-45, 48 and 50 are rejected under 35 U.S.C. 102(b) as being anticipated by Xu (US 5,340,641).

Xu teaches a PCB (Printed Circuit Board) containing a substrate with a coating containing dielectric resins such as **epoxy**, conductive powders such as **carbon black** and semiconductor powders such as **SiC** and **ZnO**, and having a plurality of electrodes (Col-3, Ln 17-51; Col-4, Ln 40-47, Fig 1 and 2; Col-7, Claim-3). Applicants teach the oxides such as ZnO to be insulators (Specification: US 2003/0071245; Para 0074). The art structure meets the limitation of planar structure in the claims. The VVM (Voltage Variable Material) functionality of the coated substrate will be inherent, because the prior art composition is identical to that by the applicants and identical compositions have identical properties. All the limitations of the instant claims are met.

The reference is anticipatory.

Art Unit: 1751

2. Claims 42 and 45-50 are rejected under 35 U.S.C. 102(b) as being anticipated by Maeda et al (US 4,671,984).

Maeda et al teach printed circuit boards comprising a laminate of thin wall body containing a resin binder with fillers and an electrically conductive metal layer. The prior art further teaches to fortify the PCB with fibrous material such as glass fabric impregnated with phenolic resin or an epoxy to improve heat resistance and dimensional stability (Abstract; Col-2, Ln 52 – Col-3, Ln 2). The prior art further teaches the addition of inorganic fillers such as silicon carbide and boron nitride that meet the limitation of conductive and semiconductive fillers in the composition, and magnesia and alumina that meet the limitation of insulative fillers in the composition. The structures in Fig 23-24 with double-faced Cu-lined PCB meet the limitations of claims 49-50. All the limitations of the instant claims are met.

The reference is anticipatory.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

1. Claims 42-45 and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hyatt et al (US 4,726,991).

Art Unit: 1751

Hyatt et al teach an overstress material composition comprising an insulative binder such as epoxy containing conductive particles such as carbon black, insulator particles such as silica alumina and semiconductor particles such as carbides and oxides (Col-8, Ln 35-37; Col-6, Ln 38-48; Col-7, Ln 7-17, 51-56).

The prior art fails to teach a VV-assembly containing printed circuit board with VVM characteristics.

However, the prior art is suggestive that the art composition could be fabricated in to PCB's (Col-5, Ln 12-18) and it would be obvious to a person of ordinary skill in the art to form a printed circuit board with reasonable expectation of success. The planar characteristics to the PCB and attaching a pair of electrodes to a circuit would be obvious.

2. Claims 42-45, 48 and 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schrier et al (US 5,068,634).

Schrier et al teach an overstress material composition comprising an insulative binder such as epoxy containing conductive particles such as carbon black, insulator particles such as silica and alumina and semiconductor particles such as carbides and oxides (Col-4, Ln 30-53, Col-6, claim-10). The prior art further teaches processing the composition by standard polymer processing techniques by mixing the composition in a roll mill and molded in to desired thickness between the electrodes (Col-5, Ln 47-61).

The prior art fails to teach a VV-assembly containing printed circuit board with VVM characteristics per claim 42 and a method of making the VVM assembly per claim 59.

However, the prior art is suggestive that the art composition could be fabricated in to PCB's (Col-1, Ln 57-63) and it would be obvious to a person of ordinary skill in the art to form a printed circuit board with reasonable expectation of success. The planar characteristics to the PCB and attaching a pair of electrodes to a circuit would be obvious.

3. Claims 59-60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Xu (US 5,340,641).

The disclosure on the PCB by Xu under 35 USC 102(b) as set forth in rejection-1 is herein incorporated.

Art Unit: 1751

The prior art is silent about preparing the PCB by mixing the resin with the particles and curing the composition.

The prior art teaches coating the substrate with the composition containing the resin and the fillers, and mixing of the components and curing of the binder would be the functional steps of the process that would be obvious to a person of ordinary skill in the art. The coating of the resin over the substrate layer meets the limitation of claim-60.

#### ***Allowable Subject Matter***

Claims 51-58 are allowed. The prior art of record neither teaches nor fairly suggestive of a PCB with the applicants composition and structure.

Claim 61 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art of record fails to teach or suggestive of forming a VVM assembly by forming the PCB having the specific composition being made by the claimed coating step.

#### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kallambella Vijayakumar whose telephone number is 571-272-1324. The examiner can normally be reached on 8-5.30 Mon-Thu, 8-4.30 Alt Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Douglas McGinty can be reached on 571-272-1029. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1751

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kmv  
March 04, 2006.



**Mark Kopeck**  
**Primary Examiner**